

What Is Claimed Is:

1. An information processing system comprising a computer device, and a storage device having a plurality of physical storage regions for storing data used by said computer device, further comprising:

physical storage region characteristics managing means for managing the level of storage characteristics provided by each of said plurality of physical storage regions;

data storage destination managing means for managing said plurality of physical storage regions and the data stored in each physical storage region, by creating associations between same;

characteristics change managing means for managing the previously determined temporal change in the level of the storage characteristics required of said storage destination physical storage region by the data managed by said data storage destination managing means; and

movement instructing means for acquiring, at prescribed times, the level of storage characteristics in the storage destination required by the data at that time, for each data item managed by said data storage destination managing means, further acquiring the level of storage characteristics of said physical storage region in which said data is actually stored, from said physical storage region characteristics managing means, comparing said respective levels, and issuing an instruction to said storage device for said data to be moved

to said physical storage region providing said required storage characteristics.

2. The information processing system according to claim 1,

wherein said characteristics change managing means comprises:

a plurality of patterns of the temporal change in the level of said storage characteristics; and

establishes the timing of said temporal change, in accordance with a pattern and a date and time specified by the user.

3. The information processing system according to claim 1,

wherein said storage characteristics are the performance, indicating the speed of processing, and the availability, indicating the speed of recovery.

4. The information processing system according to claim 1,

further comprising : physical storage region characteristics establishing means for establishing the level of said storage characteristics in each of said physical storage regions, on the basis of processing carried out with respect to each of said physical storage regions.

5. The information processing system according to claim 4,

wherein said storage region characteristics establishing means comprises:

replicate generating means for generating a replicate of the data stored in said physical storage region; and

caching means for placing the data stored in said physical storage region on a cache, as resident data.

6. The information processing system according to claim 5,

wherein said reproduction generating means sets the replicated data to have high availability; and

said caching means sets the data placed on the cache to have high performance.

7. The information processing system according to claim 1,

further comprising : data movement means for moving said data to said physical storage region having the required storage characteristics for storing said data, in accordance with instructions from said movement instructing means.

8. The information processing system according to claim 7,

wherein the data storage destination managing means manages: the logical storage regions accessed directly by said computer device which issues requests relating to said data;

and information associating said logical storage regions and the physical storage regions in which said data is stored;

and said movement instructing means acquires the level of said storage characteristics, for each data item, and for each of said logical storage regions, and if said levels do not match, then it issues a movement instruction for said logical storage region unit.

9. The information processing system according to claim 7, further comprising:

data storage destination updating means for updating the information managed by said data storage destination managing means, in such a manner that said data is associated with said physical storage region after movement.

10. The information processing system according to claim 9,

wherein the data storage destination managing means manages:

the logical storage regions accessed directly by said computer device;

logical / physical mapping information that associates said logical storage regions with said physical storage regions; and

information associating said data with said logical storage region in which it is stored; and

said logical / physical mapping information is updated in accordance with the movement performed by said data movement means.

11. A management computer device, comprising:

an interface connected via a network to a computer device and a storage device having a plurality of physical storage regions storing data used by said computer device; and

a control section and a memory connected to said control section;

wherein said memory holds the levels of storage characteristics provided by each of said plurality of physical storage regions, and the previously established temporal change in the level of the storage characteristics required of said physical storage regions forming storage destinations, by the data to be stored in said physical storage regions; and

said control section compares the level of the storage characteristics of a storage destination required by the data at a particular time, at prescribed times, for each data item, with the level of the storage characteristics of said physical storage region in which said data is actually stored, and if said levels are not matching, then it sends an instruction for said data to be moved to said physical storage region providing said required storage characteristics, to the storage device having said physical storage region in which said data is actually stored, via said interface.

12. The computer device according to claim 11,

wherein a plurality of patterns of the temporal change in the level of storage characteristics required of said storage regions are held in said memory;

and said control section establishes the timing of said temporal change, on the basis of the selection of a prescribed pattern and specification of a date and time, and acquires the storage characteristics of the storage destination required by said data at that particular time, from said memory, in accordance the pattern thus established.

13. The computer device according to claim 11,

wherein a plurality of patterns of the temporal change of the level of storage characteristics required of said storage regions are held in said memory, for each attribute of the data used by said computer device;

and said control section acquires the level of storage characteristics of the storage destination required by said data at that time, from said memory.

14. The computer device according to claim 11,

wherein the temporal change in the level of the storage characteristics required of said physical storage regions is assigned to each logical storage region provided to the computer device requesting access to data stored in said physical regions.

15. A storage device in an information processing system comprising a computational device, and a storage device having a plurality of physical storage regions for storing data used by said computational device; further comprising:

the logical storage regions accessed directly by said computer device;

logical / physical mapping information storing means for storing logical / physical mapping information creating associations between said logical storage regions and said physical storage regions;

data movement means for moving the data in said physical storage region associated with a prescribed one of said logical storage regions, to another of said physical storage regions, in accordance with an external instruction; and

association changing means for changing said logical / physical mapping information, in such a manner that said prescribed logical storage region is associated with the physical storage region after movement.

16. The storage device according to claim 15, wherein said computer device is connected to other storage devices which it cannot access directly, and access to the data stored in the physical storage regions of said other storage devices is provided in the form of logical storage regions accessed directly by said computer device;

said logical / physical mapping information storing means comprising logical / physical mapping information creating associations between said logical storage regions and the physical storage regions in said other storage devices.

17. A data locating method for a computer device and a storage device having a plurality of physical storage regions storing data used by said computer device, whereby data is located in a physical storage region providing the level of

storage characteristics required said data, comprising the steps of:

establishing and storing the level of said storage characteristics provided by each of said physical storage regions;

comparing said storage characteristics level required by said data at a particular time, with said storage characteristics level of said physical storage region in which said data is actually stored, at prescribed times, in accordance with previously established temporal change in said level of storage characteristics required of the storage destination physical storage region by said data, and judging whether or not said levels are matching; and

instructing said data to be moved to a physical storage region having said storage characteristics level required by said data at that time, if said judgment result indicates that the levels are not matching.

18. A computer-readable storage medium storing a program for causing a computer to perform the functions of:

physical storage region characteristics managing means for managing the level of storage characteristics provided by each one of a plurality of physical storage regions of a storage device storing data used by a computer device;

data storage destination managing means for managing the data stored in the logical storage regions accessed directly by said computer device, by creating associations;



characteristics change managing means for managing the previously determined temporal change in the level of the storage characteristics required of said storage destination physical storage region by the data managed by said data storage destination managing means; and

movement instructing means for acquiring, at prescribed times, the level of storage characteristics in the storage destination required by the data at that time, for each data item managed by said data storage destination managing means, from said characteristics change managing means, further acquiring the level of storage characteristics of said physical storage region in which said data is actually stored, from said physical storage region characteristics managing means, in accordance with information for said logical storage region associated with said data in said data storage destination managing means, and information relating to the association between the logical storage regions and the physical storage regions managed by said storage device, comparing said respective levels, and issuing an instruction to said storage device for the logical storage region in which said data is stored to be moved to said physical storage region providing said required storage characteristics.

19. The computer-readable storage medium according to claim 16, further causing a computer to perform the functions of:

data replicating means for instructing replication of data stored in a particular physical storage region of the plurality of physical storage regions of a storage device managed by a management device controlled by said computer;

caching means for instructing that data stored in a particular physical storage region of the plurality of physical storage regions of a storage device managed by a management device controlled by said computer is to be placed on the cache as resident data; and

storage characteristics level establishing means for establishing the respective storage characteristics levels of said plurality of physical storage regions, in accordance with processing carried out by said data replicating means and said data caching means.

20. A computer system, comprising:

a computer device connected to a network;

a management computer device having a first interface connected to the network and a first memory and first control section;

a first storage device comprising a second interface connected to said computer device via the network, a third interface connected to another external storage device, physical storage regions for storing data used by said computer device, a second control section and a second memory; and

a second storage device comprising a fourth interface connected to said first storage device by means of the network, a third control section, physical storage regions storing data used by said computer device, and a third memory;

wherein said management computer device holds, in said first memory, the levels of storage characteristics, including the performance indicating the processing speed and the availability indicating the recovery speed, provided by each of said plurality of physical storage regions, and previously established temporal change in the level of storage characteristics required of said physical storage region forming a storage destination, by the data stored in said physical region;

said first control section comprises a plurality of patterns of temporal change in the level of said storage characteristics, establishes the timing of said temporal change in accordance with a pattern and date and time specified by a user, and compares the level of the storage characteristics of a storage destination required by the data at a particular time, for each data item, at prescribed times, on the basis of the timing thus established, with the level of the storage characteristics of said physical storage region in which said data is actually stored, and if said levels are not matching, then it sends an instruction for said data to be moved to said physical storage region providing said required storage characteristics, to the storage device having said

physical storage region in which said data is actually stored, via said interface;

said first storage device holds, in said second memory, logical / physical mapping information for said first logical storage regions provided in order that said computer device can request data, and the physical storage regions actually located in said first storage device, in which said data is stored; and associations between said first logical storage regions, the logical storage regions provided externally by said second storage device, and the physical storage regions in which said data is stored;

said control section receives said movement instructions via said second interface, and if said data movement is a movement between said first storage device and said second storage device, then it section refers to said associations, and specifies the logical volume of said second storage device relating to said movement, by means of said third interface, as well as instructing movement of the data to said second storage device; and

moves the data stored in said physical storage region to a designated physical storage region, in accordance with said instruction, and updates said logical / physical mapping information and said associations, in accordance with said movement;

said second storage device holds, in said third memory, associations between said logical storage regions provided

externally and the physical storage regions in which said data is stored; and

said third control section receives a data movement instruction from said first storage device, via said fourth interface, and performs movement of said data.